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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,924	09/24/2004	Makoto Motoyoshi	075834.00325	8150
33448	7590	11/29/2006	EXAMINER NGUYEN, TRAM HOANG	
ROBERT J. DEPKE LEWIS T. STEADMAN ROCKEY, DEPKE, LYONS AND KITZINGER, LLC SUITE 5450 SEARS TOWER CHICAGO, IL 60606-6306			ART UNIT 2818	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/508,924

Applicant(s)

MOTOYOSHI ET AL.

Examiner

Tram H. Nguyen

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 20-38 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-13 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 05/01/2006.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

During Applicant's interview on 11/06/2006 has been carefully considered by the examiner. The arguments advanced therein are persuasive with respect to the restriction of record and those election/restriction is accordingly withdrawn. Group I, species A, claims 1-19 are pending in this application.

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8,14-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (US 2002/0034094; hereinafter refer to Saito).

Regarding **claim 1**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (item 15); a second wiring (item 16) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (item 13) which is electrically insulated from said first wiring (15) and electrically connected to said second wiring (16) and which is formed in the region of intersection of said first wiring (15) and said second wiring (16) such that a tunnel insulating layer item 22) is sandwiched between ferromagnetic materials (items 21/23) which change in resistance depending on whether the spin direction is parallel or antiparallel, thereby recording information; wherein said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer (item 18) formed at least on the lateral sides of said first wiring (item 15) and on the side of said first wiring (15) which is opposite to the side facing said tunnel magnetoresistance element(13), with at least either of said high-permeability layer formed on the lateral sides of said first wiring projecting from said first wiring toward said tunnel magnetoresistance element (see fig. 10).

Regarding **claim 2**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed also on the surface of the first wiring close to the tunnel magnetoresistance element.

Regarding **claim 3**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows an insulating film (19) is formed between the magnetic flux concentrator (18) and the first wiring (15).

Regarding **claim 4**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows wherein the magnetic flux concentrator (18) has the high-permeability layer formed, with an insulating film (19) interposed, also on the surface of the first wiring (18) close to the tunnel magnetoresistance element (13).

Regarding **claim 5**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (16); a second wiring (15) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (item 13) which is electrically insulated from said first wiring (16) and electrically connected to said second wiring (see fig. 9A) and which is formed in the region of intersection of said first wiring and said second wiring such that a tunnel insulating layer (item 22) is sandwiched between ferromagnetic materials (items 21/23) which change in resistance depending on whether the spin direction is parallel or antiparallel, thereby recording information (see fig. 9A); wherein said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer (item 18) formed at least on the lateral sides of said second wiring (item 15) and on the side of said second wiring (15) which is opposite to the side facing said tunnel magnetoresistance element (13), with at least either of said high-permeability layer formed on the lateral sides of said second wiring

projecting from said second wiring toward said tunnel magnetoresistance element (see fig. 10).

Regarding **claim 6**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed also on the surface of the second wiring close to the tunnel magnetoresistance element.

Regarding **claim 7**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows an insulating film (19) is formed between the magnetic flux concentrator (18) and the second wiring (15).

Regarding **claim 8**, Saito discloses all the limitations of the claimed invention for the same reasons as set forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed, with an insulating film interposed, also on the surface of the second wiring (15) close to the tunnel magnetoresistance element (13).

Regarding **claim 14**, Saito discloses a nonvolatile magnetic memory device of the type having: a first wiring (16); a second wiring (15) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (13) which is electrically connected to said first wiring (16) through a switching element and is electrically connected to said second wiring and which is formed in the region of intersection of said first wiring and said second wiring such that a tunnel insulating layer is sandwiched between ferromagnetic materials which change in resistance depending

Art Unit: 2818

on whether the spin direction is parallel or antiparallel, thereby recording information (see fig. 9A); wherein said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer (18) formed at least on both of the lateral sides of said first wiring (15) and on the side of said first wiring which is opposite to the side facing said tunnel magnetoresistance element (13), with at least either of said high-permeability layer formed on the lateral sides of said first wiring (15) projecting from said first wiring toward said tunnel magnetoresistance element (see fig. 10).

Regarding **claim 15**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows an insulating film (19) is formed between the magnetic flux concentrator (18) and the tunnel magnetoresistance element (13).

Regarding **claim 16**, Saito disclose a nonvolatile magnetic memory device of the type having: a first wiring (16); a second wiring (15) intersecting three-dimensionally with said first wiring (see fig. 9A); and a tunnel magnetoresistance element (13) which is electrically connected to said first wiring (16) through a switching element and is electrically connected to said second wiring (15) and which is formed in the region of intersection of said first wiring (16) and said second wiring (15) such that a tunnel insulating layer (22) is sandwiched between ferromagnetic materials (21/23) which change in resistance depending on whether the spin direction is parallel or antiparallel, thereby recording information (see fig. 9A); wherein said magnetic memory device comprises a magnetic flux concentrator of high-permeability layer (18) formed at least on both of the lateral sides of said second wiring (16) and on the side of said second

wiring (16) which is opposite to the side facing said tunnel magnetoresistance element (13), with at least either of said high-permeability layer formed on the lateral sides of said second wiring projecting from said second wiring toward said tunnel magnetoresistance element (see fig. 10).

Regarding **claim 17**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed also on the surface of the second wiring close to the tunnel magnetoresistance element.

Regarding **claim 18**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows wherein an insulating film (19) is formed between the magnetic flux concentrator (18) and the second wiring (15).

Regarding **claim 19**, Saito discloses all the limitations of the claimed invention for the same reasons as set-forth above. Besides, Fig. 10 shows the magnetic flux concentrator (18) has the high-permeability layer formed, with an insulating film interposed, also on the surface of the second wiring close to the tunnel magnetoresistance element.

Allowable Subject Matter

Claims 9-13 are allowable over the prior art of record because none of these references disclose or can be combined to yield the claimed invention such as "the magnetic memory device comprises a magnetic flux concentrator of high-permeability

layer formed between said first wiring and said tunnel magnetoresistance element and on the lateral sides of said tunnel magnetoresistance element, with an insulating film interposed" in claim 8 and the "magnetic memory device comprises a first magnetic flux concentrator of high-permeability layer formed at least on both of the lateral sides of said first wiring and on the side of said first wiring which is opposite to the side facing said tunnel magnetoresistance element and a second magnetic flux concentrator of high-permeability layer formed between said first wiring and said tunnel magnetoresistance element and on the lateral sides of said tunnel magnetoresistance element, with an insulating film interposed" in claim 10.

Conclusion

When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tram Hoang Nguyen whose telephone number is (571) 272-5526. The examiner can normally be reached on Monday-Friday 9:00am - 6:00pm.

Art Unit: 2818

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mathew Smith can be reached on (571) 272-1907. The fax numbers for all Customer Service is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571)272-1625.

THN
Art Unit 2818
Date

Andy Hought
Andy Hought
Primary Examiner